Maine Agriculture: A Natural Resource Based Industry Constantly Adapting to Change

Stewart Smith
Department of Resource Economics & Policy
University of Maine

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Author's Note: This paper was prepared at the request of Governor John Baldacci to identify for Maine people the importance of agriculture to the Maine economy and culture and the nature and scale of the current threats to them and to encourage fresh, creative ways of thinking about the industry that will position it as a long-term, sustainable natural resources-based industry in Maine.

It is not an official position paper of the Governor or any state agency.

The ideas and perspectives in this paper are drawn largely from a preliminary *Summit Meeting on Maine's Natural Resource-Based Industries* held in March 2003, a number of secondary sources on Maine agriculture, comments on an outline paper, and the author's own work and familiarity with Maine agriculture. The paper benefited from review of a previous draft by a large number of readers and formal comments from twenty-two.

Maine agriculture continues to respond and adapt to new world environments with varying degrees of success. It has historically done so, and continues today. Some of these responses are represented by long historical trends; others may be the start of new trends. This paper explores those trends as part of the context to understanding the current condition of Maine agriculture. It then lists a number of strengths and weaknesses of Maine agriculture, discusses opportunities provided by them, and suggests some "new ways" of thinking that might further the capture of those opportunities.

The paper focuses largely on the farming sector, since it holds most of the land base and has been the major constituent of Maine agricultural policy. It focuses less on the processing and the distribution and retailing sectors, although each is a much larger component of the food and agricultural system than farming. It is important to recognize that while the focus of the paper is on the farming sector, food processing and distribution are essential components of the Maine food and agricultural system, and each substantially exceeds farming in economic value added.

Background

Industry Structure: Two Perspectives

Maine agriculture today can be viewed from two perspectives. The more common view is of an industry that produces agricultural commodities. This view is commonly referred to as *commodity agriculture*[1]. By that view we perceive Maine agriculture to be potatoes (about $100 million sales per year), milk (~$100 million), eggs (~$60 million), blueberries (~$30 million), nursery (~$25 million), vegetables (~$20 million), cattle (~$15 million), apples (~$10 million), and a number of commodities with lesser sales[2]. Most of that production is destined for regional, national, and international markets, often through commodity processors. Altogether, sales at the farm level totaled $419 million in 2001 (New England Agricultural Statistics Service). Thirty years ago, from this perspective, Maine agriculture would have been potatoes, broilers, eggs, and milk, with apples, blueberries, cattle, and other commodities, all totaling nearly $400 million. While the mix of commodities has changed somewhat, the nominal value is quite similar, suggesting a decline in real value since the mid-1970s (Table 1).

Table 1: Maine Cash Farm Receipts without Aquaculture
(Selected years in nominal dollars, millions)

	1970	1973	1975	1980	1985	1990	1995	2000	2001	Composite (1973-2001)
Potatoes	67.5	141.8	88.1	96.0	79.9	139.5	97.1	114.8	101.8	107.4
Milk	42.2	50.8	61.1	91.6	91.1	91.9	88.3	93.2	105.8	84.2
Eggs	50.3	79.2	90.1	104.6	79.4	90.0	73.8	56.4	56.6	78.8
Other Poultry	54.7	86.8	91.1	85.7	35.0	4.6	3.9	3.6	3.0	39.2
Blueberries	1.9	5.9	3.2	8.1	11.4	27.7	21.0	44.3	23.0	18.1
Cattle	7.8	9.7	6.3	14.5	20.3	19.7	16.4	17.4	17.0	15.2
Green/Nursery	2.2	3.0	3.5	6.6	8.9	18.8	28.6	23.9	24.4	14.7
Vegetables	4.3	4.2	3.4	4.3	4.3	13.6	18.4	27.0	24.4	12.5
Apples	5.0	13.9	7.5	12.5	13.0	15.3	10.2	9.9	9.2	11.4
Other	5.3	3.3	12.7	11.0	30.5	28.7	47.5	51.1	54.0	29.9
Total	**241.2**	**398.6**	**367.0**	**434.9**	**373.8**	**449.8**	**405.2**	**441.6**	**419.2**	**411.3**

Source: Economic Research Service

In addition to farm sales, commodity agriculture includes a processing sector that converts raw agriculture products grown in Maine into processed products for sale to consumers or for further processing, especially for milk, blueberries, and potatoes. This

[1] It should be noted that *commodity* as used here is quite different from its use by USDA where commodity refers to grains and other crops specified in certain Federal legislation. There, potatoes and blueberries, two of the largest crops of Maine commodity agriculture, are identified as specialty, rather than commodity, crops.

[2] Since aquaculture is not considered part of agriculture in this project, this paper does not include those sales, which currently add about $50-60 million to Maine farm sales when included.

industry segment represents about $500 million of sales, or about 50% of total food processing in the State, and is vital to the viability of commodity farming.

An alternative perspective of Maine agriculture is of a state food and agricultural system, where agriculture is an industry that provides food and related products to human consumers. This perspective is usually referred to as *local agriculture*. In this way, we can view Maine agriculture as a system with direct economic activity of about $3.3 billion. Agricultural production (farming plus input sector) comprises about 13% of that system (~$435 million), food processing 30% (~$1 billion), and food distribution and retailing 57% ($1.9 billion) (Gandee). While farms are distinct from non-farm firms in the food processing and the distribution and retailing sectors in this perspective, a number of farms do provide those services, albeit on a relatively modest scale. As some Maine farms find global commodity markets less attractive, opportunities to provide marketing services within the Maine food and agricultural system become more attractive.

While the above perspectives are laid out as two distinct systems, it is important to recognize that many Maine farms fall along a continuum between these two systems. However, the distinction between Maine agriculture as a commodity producer/processor system or as the Maine food and agricultural system is a useful and compelling one when considering the historical context, future direction, and policy implications of Maine agriculture.

The Maine Agricultural Land Base

A viable agriculture depends on an adequately productive land base. In 1997, Maine had 1.2 million acres in farmland, a decline of more than 50% since 1964. Of that, 534,000 were in cropland compared to 894,000 in 1964. By county, Aroostook, with 188,000 acres in 1997, contained one-third of all Maine's cropland. Penobscot had 49,000, Kennebec 45,000, and Somerset and Washington 36,000 each. Five counties, Waldo, Cumberland, York, Androscoggin, and Oxford each had between 20,000 and 30,000 of cropland, much of it in areas under heavy development pressure (U.S. Department of Agriculture).

According to the State Planning Office, between 1992 and 1997, Maine converted 33,560 rural acres *per year* to development, a rate four times that of the previous decade, and greater than the cropland in nine Maine counties. This conversion had moved out from more heavily populated areas in the southeastern portion of the state to more rural towns with natural resource based industries. It has resulted in the loss of a substantial volume of land used by the livestock industry to pasture animals and produce feed crops (Maine State Planning Office).

Substantial anecdotal evidence indicates that residential development pressure extends the length and breadth of Maine, boosting market values above those generated by agricultural production. In the northern areas, the demand is for individual house lots and seasonal homes, rather than commercial development; but the impact on fragmenting the agricultural landscape and increasing farming costs is similar. The Maine Department of

Agriculture, Food and Rural Resources (2003) recently published the results of a two-year planning process to address farmland-loss statewide.

It should also be noted that agricultural production is unevenly spread across the Maine landscape. Most Maine potatoes are produced in Aroostook County, most of the milk is produced in a seven county dairy belt centered around Kennebec County, and most blueberries are produced in Washington and Hancock Counties. These areas are particularly vulnerable to price and yield fluctuations of their particular commodities.

Farm Numbers, Size, and Types: Some Historical Context

Trends of farm numbers and size tell an interesting story of Maine agriculture that is somewhat different from agriculture nationally. Like all states, Maine had substantially more farms at the beginning of the last century than at the beginning of this one (Table 2). As farming has become more industrialized, farming activities have been replaced by non-farm activities, and labor has moved from the farm to non-farm jobs, many to the input or marketing sectors of the food and agricultural system. At the national level, between 1910 and 1997, farming activities and returns constantly declined while marketing and input activities constantly increased. As a proportion of the domestic food and agricultural system, farming returns declined about 65% while the marketing share increased by 35% and the input share by 40% (Figure 1). The Maine picture is quite consistent in terms of these shifts, with the input sector claiming less than 50% of farm revenues in 1950, but 70% in 1997 (Smith 1999).

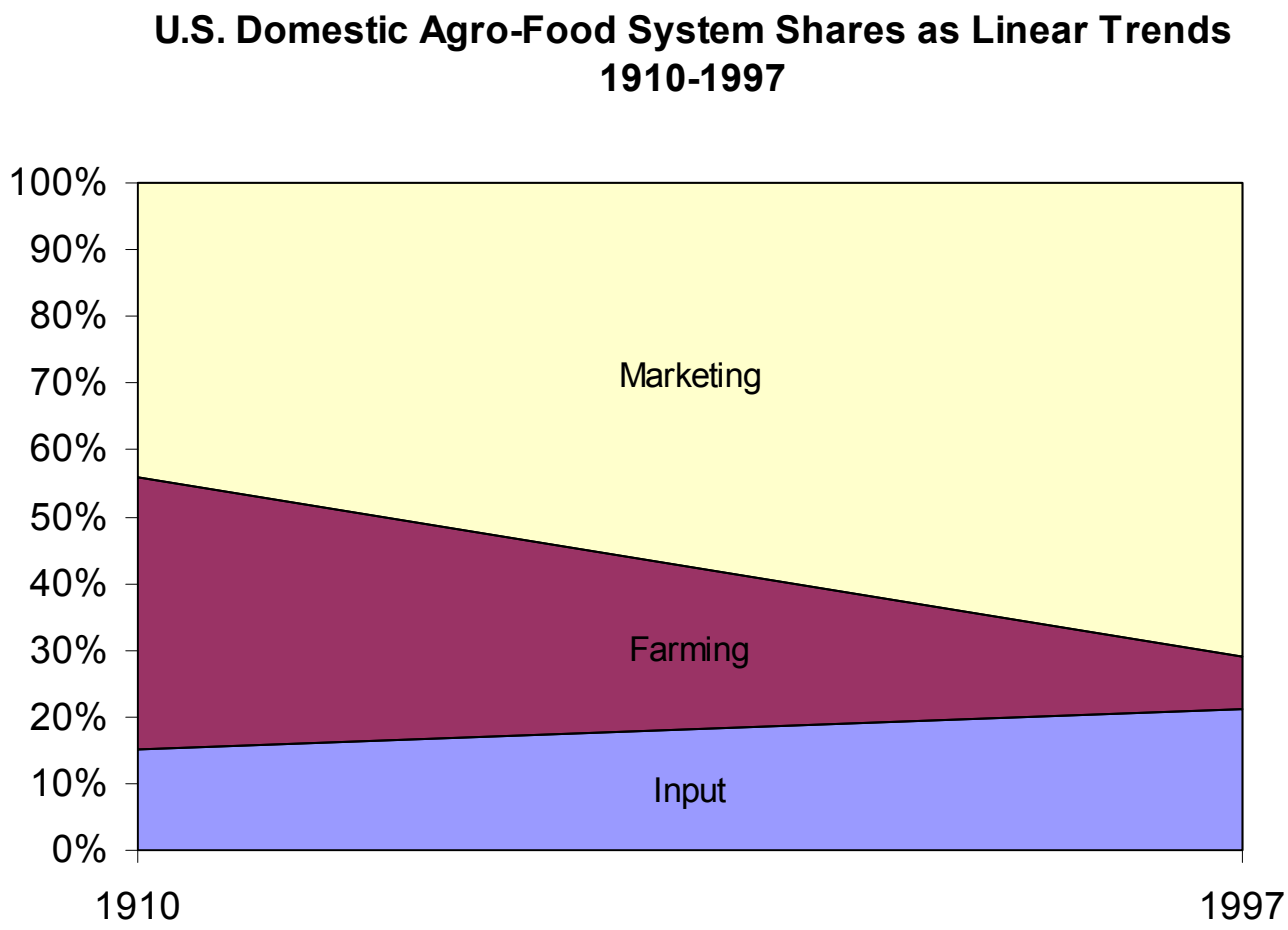
Industrialization has simplified farming systems and allowed farmers to operate larger farming units. By capturing economies of scale, larger farms can expand by buying smaller farms, a trend that represents economic land use rationalization and continues today in commodity agriculture. Specialization and economies of scale provided by the industrialization of agriculture allowed areas within the State to specialize in the

Table 2: Size Consolidation of Maine Farms
(Selected Years, 1880-1997)

	1880	1910	1978	1997
# of Farms	64,309	60,016	6,775	5,810
Acres/Farm	102	105	221	209
Sales/Farm ($1992)		17,026	97,226	71,110

Sources: Ahn et.al; Smith

Figure 1:



Source: Smith & Files

production of specific commodities. Potatoes contributed 50% of total farm revenues in Aroostook County in 1910, and 83% in 1997. Dairy, the largest individual commodity produced in Kennebec County, contributed just 15% in 1910, and fully 45% of revenues in 1997 (Smith). Consolidation, concentration, and regional specialization shaped the structure of Maine agriculture throughout the past century.

Despite the similarities between Maine and U.S. agriculture in the above trends, Maine has diverged from national trends in interesting ways since the 1970s. Average farm size increased from 105 acres in 1910 to 216 acres in 1980, and has since leveled off. In constant dollars, the average sales per farm increased nearly 500% from 1910 to 1980, but have declined since (Table 2). The halt to the growth in average farm size in Maine since the mid-1970s resulted from the entry of smaller farms, usually participating in local agriculture, rather than a change in the direction of commodity agriculture. In

Maine, unlike most states, farm numbers remain quite stable and average size even declines, while commodity farms continue to get larger and fewer.

The increase in smaller, more diversified farms since the 1970s suggests a growing and potentially viable farming sector for Maine. This agriculture appears in at least two forms. One is a relatively small but quite diversified farm that sells its output to the final consumer who usually is a local resident or visitor, or to a local institution. These farms are likely to be near population areas and are substantially integrated into their local community.

Another farm type seems to be proving viable at the mid-size range by alleviating some of the dependence on economies of scale. This farm is moving away from the strict commodity model on the production side, but not necessarily on the marketing side, although it may access higher value markets. Costs are reduced with a more complex production system, including integrating crops and livestock enterprises. The characteristics of these farm types are outlined in Appendix A.

While these farm types generally produce less than a specialized commodity farm in total farm output, on a per unit basis they can leave more net income for the farm, generate more value added for the total farming sector, and often integrate more directly into the local community. They offer hints to policy options designed to maintain farm numbers. As long as commodity agriculture efficiencies are driven by economies of scale, commodity farms must continue to get larger and fewer even as production is maintained or increased. On the other hand, small and moderate sized farms can become an important component of the local food system.

Maine seems to be moving towards a viable, dual agricultural structure that has important implications for state agricultural policy.

Strengths

Despite a decline in total real value of commodity agricultural production, Maine agriculture has a number of strengths.

A diverse agriculture. Maine agricultural production, compared to other states, is quite diversified. The largest single valued commodity in Maine, usually potatoes, generally represents less than 25% of total farm sales. Several states depend on a single commodity for 50% of farm revenues; Vermont gets 75% of its farm sales from dairying. Unlike most other states without a single dominant commodity, such as California or Florida, Maine farm sales are evenly split between crop and livestock revenues, and six

commodity categories contribute at least 5% to farm sales. All of these measures point to Maine being a relatively diverse producer of agricultural commodities.

Within these conventional measures of agricultural diversity, Maine agriculture offers a large number of certified organic farms, a dominant seed potato subsector, an aggressive wild blueberry marketing strategy, a growing potato processing sector, a quality-seal milk marketing program, a growing winter vegetable subsector, and nationally recognized vegetable seed firms, to name a few.

This diversity has at least two major advantages. It provides some statewide protection from disruptive production and marketing episodes that result from temporary low yields or prices; and it provides greater flexibility to respond to changing consumer demands and market opportunities. On the other hand, it also adds to the complexity and costs of providing services.

Farm production near consumers. Many of our farm production resources are located near residential areas. While this can often create conflicts between local residents and farmers over farming practices that residents may perceive to be disruptive, it provides considerable opportunity for farmers to market their product more directly to consumers and to sell products with a farmer identity. Both of these attributes allow farmers to provide marketing services and to tap into the substantial amount of marketing margins in the food and agricultural system.

A large local market relative to farm production. In addition to proximity to consumers, Maine farmers also enjoy a relatively large local market relative to the value of farm sales. Maine households purchase about $3 billion of food products and services annually. Maine farmers currently contribute less than 4% of that value. If farmers provided 10% of Maine consumers' food goods and services, farm income would increase by $180 million annually. There appears to be ample room for Maine farmers to grow this market segment.

A strong commodity processing sector. Maine has a reasonably strong processing sector that contributes to the global competitiveness of Maine's commodity agriculture. While only one major frozen fry plant remains in Aroostook County, it now supplies the fast food market, the premium market place for frozen fries and one unavailable to Maine farmers in the past. The plant takes nearly one third of the annual potato crop and is part of a large privately held Canadian food processing firm. A number of smaller firms process an array of other potato products.

About half the milk produced on Maine farms is processed in one of the State's four processing facilities, two of which remain independent and locally-owned. The other plants are owned by two national milk processing firms that have been purchasing local and regional processors to achieve advantages associated with dominant national milk marketers. Two of the plants are located within the city of Portland; a third is a relatively new facility on the outskirts of Bangor; the fourth and smallest is in Aroostook County.

Most of the wild blueberry crop is processed by one of the seven established freezers in Washington and Hancock Counties. One of those is Canadian-owned, with plants on both sides of the border, and one Maine-based firm has a processing facility in Canada. Blueberries move freely across the international border during the freezing season.

Canadian management and capital. While the relationship between Maine agriculture and Canada is complex and multifaceted, Canadian management and capital play an important role in Maine agriculture by supporting a substantial portion of the frozen fry processing capacity in the Maine potato industry, and a part of Maine's wild blueberry processing. While there is considerable episodic tension between Canadian and U.S. agricultural interests, it is likely the Maine food processing infrastructure would be substantially compromised without access to Canadian management and capital.

A climate of natural rainfall and pest suppression. While on balance our climate is a harsh one for growing several long- and warm-season crops, Maine agriculture has certain favorable climatic conditions. Our natural rainfall allows production of certain crops for certain markets without supplemental irrigation. Many feed crops and vegetables are produced without irrigation, reducing production costs for established farmers and capital requirements for entering farmers. However, in some years, crops grown without irrigation can experience low marketable yields, resulting in market share and financial losses for farmers. Lack of irrigation on much of Maine's potato crop has recently been identified as a substantial industry constraint (Planning Decisions).

While our short growing season limits certain crop production options, when combined with our relatively long and cold winters it can also substantially limit pest pressures. A number of pests do not make it through our winters, and the short growing season limits the number of pest generations per season. Pest management options are increased, allowing reduced costs and the potential capture of green market advantages for both commodity and local agriculture farmers.

A well-organized industry forum. Maine agriculture is relatively well organized to reach consensus, develop strategies, and promote solutions. The Maine Farm Bureau continues to provide a statewide industry voice for many farmers across commodity interests. Several established commodity groups have trade associations, although they assume various forms. Several newer and smaller industry segments are now organized into associations. Unlike many other states, Maine has a strong alternative agriculture association, the Maine Organic Farmers and Gardeners Association (MOFGA), with some 4,000 members and a strong lobbying presence, and an emerging Maine Sustainable Agriculture Society (MESAS).

All these groups, as well as the Maine Department of Agriculture, University of Maine agricultural administrators, and Federal government personnel participate in an umbrella coalition, the Agricultural Council of Maine (AGCOM) that can provide a consensus voice for Maine agricultural production.

Weaknesses

Despite a number of strengths, Maine agriculture also faces some weaknesses.

A land base limited in quantity and quality. Relative to most other states outside New England, Maine has a limited land base in both quantity and quality. With the exception of Aroostook County's farming area, the Maine landscape is one of forestlands with occasional fields, often along river valleys. For the most part, contiguous farming fields are in the tens of acres, rather than the hundreds or thousands of acres found in other parts of the country. This limitation will become increasingly critical for commodity farmers who must compete in regional and national markets by capturing economies of scale. As future efficiency gains call for 2,000-acre potato farms and 1,000-head dairy farms, fewer and fewer Maine farms, especially outside Aroostook, will find the land base to remain competitive, although some will capture certain scale economies by establishing production units in multiple locations.

In addition to a limited land area, outside of certain areas in Aroostook County and some valley intervales, the quality of the land base is challenging. The soils are naturally acidic and many are stony and shallow to bedrock. Substandard soil quality in many areas increases the cost of production for many cropping options.

Sprawl and development pressures. Much of the agricultural land base, especially in central and southern Maine, is under growing development pressure. Across much of Maine, market values for agricultural lands exceed their agricultural production value, even for farms that are otherwise profitable. As more agricultural land is developed in an area, the more difficult it becomes for commodity farmers to remain competitive. In many cases, they lose access to agricultural land and face erosion of both private and public infrastructure support. Much of the current development in rural areas is taking place along the southern and central I-95 corridor, among a substantial volume of dairy and mixed vegetable production. Without appropriate land use incentives and controls, development pressure means agricultural land is unlikely to transition to new farmers for agricultural use in many areas of the State.

A short growing season. While Maine's climate is difficult for some agricultural pests, it also limits crop choices. Degree-days in Maine are low compared to most agricultural areas in the U.S., substantially limiting our choice of crops and crop varieties. We can grow grain corn, but Maine farmers cannot use the late maturing varieties that produce high yields and low per unit costs. Aroostook County's comparative advantage is in potato production, but the short growing season limits production protocols that produce high yields like those in the Pacific Northwest, for example.

Limited water supplies. While we have more natural rainfall than some areas, the low financial margins and demand for product consistency associated with commodity markets and the need for consistent yields associated with local agriculture increasingly require supplemental irrigation, and Maine has limited access to water supplies. We lack large, easily accessible aquifers found in many agricultural states, and we have no river

systems dammed to provide irrigation water for agriculture. Concern for wetlands protection requires farmers to build costly reservoirs from which to irrigate. With an increasing need for supplemental irrigation, lack of water access will put Maine agriculture in a deteriorating competitive position without effective policy support.

High input and labor costs. Relatively high labor and purchased input costs put Maine farmers at a disadvantage. Most purchased inputs carry a relatively high transportation cost; and especially in the more central and southern areas of the state, labor costs are high compared to some other major agricultural areas. Some farmers experience the effects of a lack of labor because of the difficulty to pay competitive local wages and benefits. In other cases, some cropping systems have heavy seasonal labor demands making it difficult to find adequate labor supplies for short periods.

The Canadian proximity. The Canadian factor is a weakness as well as a strength. While we get substantial capital and management resources from Canada, some important commodity markets are supplied by Canadian sources. Because of exchange rates, certain Federal programs, and special agricultural trade regulations, Canadian competition, especially in the potato sector, is very aggressive and often perceived to be unfair. Solutions to these issues, however, lie more with Federal than state policy.

Difficulty remaining competitive. Several of the above factors will limit the ability for a substantial number of Maine commodity producers to remain competitive, although total production and farm sales may be maintained and in some cases increased. For example, Maine's dominance in the national tablestock potato market has passed, but markets for Maine processed potatoes have expanded.

Maine milk production is experiencing market trends similar to tablestock potatoes. Federal "market reform" of the dairy sector means further withdrawal of the federal government from price-support intervention. Maine dairy farmers are finding that the higher costs of producing milk in Maine makes it increasingly difficult to compete in the regional market in this less-regulated market. In the long run, commodity milk producing survivors will likely be those that can continue to capture economies of scale or adopt cost-reducing strategies like intensive grazing.

The regional apple market represents a dramatic example of the difficulty of commodity competition for Maine farmers. Maine apple sales have declined over the past two decades, first from competition from domestic supplies, forcing a number of smaller orchards to sell out, and then indirectly from foreign supplies, including apple juice imported from China, that has resulted in the closure or downsizing of some of the State's larger orchards. The apple industry is reorganizing into one that serves local markets and may represent a precursor to other commodity industries in Maine.

Opportunities

The above strengths and weaknesses suggest a number of opportunities for Maine agriculture, especially its farming sector.

Maintaining a base of competitive commodity farms. While commodity farms are declining in number and will continue to do so, they will continue to produce the majority of farm income and use the bulk of the resource base for the foreseeable future. The Maine resource base can sustain a certain number of commodity farms in certain areas. Given the existing infrastructure support and human resource capacity, these farms should continue to produce economic returns to farm families, employees, and rural communities, although the number of employees per unit of output will continue to decline. Much of the output will reach consumers through in-state processing firms, further contributing to Maine's economic base, and requiring appropriate attention from state policy makers and regulators.

Capturing local food expenditures. Maine farmers can likely capture a substantially larger share of local food expenditures. Local agriculture farming is growing in Maine. Some of that growth has been in selling directly to Maine consumers, and some from sales of value-added products. There is increased interest in marketing through the existing local retail and institutional systems. Much of Maine's farmland is located close to local consumers, and local agriculture farmers can capture economies of scope, gaining efficiencies from multiple synergistic activities rather than from high volumes of single commodities necessary for capturing economies of scale. This farm type is also more compatible with the fragmentation of farmland in central and southern Maine. While the potential for local agriculture has not been carefully established, the size of the potential market suggests it could be substantial.

Diversifying farming systems. Diverse production and marketing systems, even without livestock and cropping integration, can generate economies of scope, especially in providing marketing services. Economies of scope are per unit cost reductions achieved from doing multiples activities, like taking ten products at a time, rather then one, to a farmers market. Economies of scale are achieved by producing a high volume of the same commodity. Economies of scope achieved in providing marketing services to a number of products, especially within a local food system, often compensate for the lack of economies of scale experienced by Maine's smaller but more diverse farming systems.

Integrating livestock and cropping enterprises. A number of Maine farms are demonstrating that farming systems that integrate livestock and cropping enterprises can reduce the need for purchased inputs, especially chemical fertilizers, and so reduce production costs. Integrating cropping and livestock systems can also provide environmental benefits and increase soil quality, resulting in long term yield increases. Since most commodities in Maine are now produced in specialized production areas, the potential for gain is extensive, provided the management of these more complex systems can be worked out. That will mean, among other impacts, an increase in cash crop farming in the central Maine dairy belt, and an increase in livestock production in the

potato areas of northern Maine, both of which will require substantial infrastructure support.

Challenges

Finding a shared vision and common policy. Finding a shared vision – an agreement on strengths, weaknesses, and opportunities – will be necessary if Maine agriculture is to adjust to the changing agricultural environment that is beyond its control. A shared vision should drive state policies and resources towards opportunities that are achievable and have the best payoff for the State. That challenge is aided in Maine by the industry's organizational structure currently in place.

Maintaining an adequate land base. Maintaining an adequate agricultural land base is a substantial policy challenge for Maine. Many agricultural land protection programs tend to reduce, or threaten to reduce, the asset value of farmland owners. Without an adequate land base, however, farming opportunities cannot be captured. In much of Maine, farmland is under development pressures, some more severe than others. That pressure must be adequately resolved in favor of maintaining appropriate land in agriculture if Maine agriculture is to remain viable.

Transitioning agricultural resources. Responding to opportunities will likely require transitioning some existing agricultural resources to new uses and in some cases with new farmers. Many farmers prefer the production process and will not want to shift to systems that require more attention to providing marketing services. Transitioning farm resources will be challenging, and more so with new farmers.

Supporting entry farmers. Assuring that new farmers have access to agricultural resources is critical if Maine is to maintain farm numbers. Unlike earlier years, many new entrants, especially those in the growing local agriculture segment, are not from farm backgrounds. They have no farm to take over. They must assemble a comprehensive package, usually with third party financing. In other cases, farms transfer within families. The substantial value of assets to be transferred, and the limited liquidity often associated with them, presents challenges to the exiting – and often retiring – farmer, as well as to the entering generation.

Enlisting and directing agricultural research. Research and development will continue to be essential for commodity farmers to remain competitive, especially as Maine farmers find themselves increasingly relying upon markets for higher valued products. In addition, if integrated farming systems are potentially beneficial, considerable research will have to be conducted to develop methods for managing these more complex systems. For at least a century, much agricultural research has focused on simplifying farming systems. Shifting research to support more complex systems will require considerable change in agricultural research direction.

Assuring effective and efficient regulations. Farmers manage substantial land resources that can impact the environment, and they employ a substantial number of workers, including seasonal and migrant workers. Consequently, they face substantial environmental and labor regulation. Additionally, food processors and distributors, which are essential to the commodity system, are substantially impacted by state regulations. Regulatory protocols must be effective in achieving their purpose and efficient for both regulator and regulated in their implementation.

Balancing marketing support. Finding the proper balance between public support for commodity marketing that relies on external markets, and for local agriculture that relies on internal markets, presents a balancing act. External markets will consume the greater volume of Maine's farm production, but local markets will likely provide an increasing value to Maine farms. Finding and implementing the proper balance will not be easy.

Some New Ways of Thinking

Recognizing declining commodity farm numbers. While commodity agriculture will continue to utilize the bulk of farm resources and produce the bulk of farm output, a decreasing number of Maine commodity farms will remain competitive in national markets, implying that support to commodity farming must be carefully targeted and managed. Many commodity farms will likely exit or transition to other farming systems. Misdirected public support will slow necessary adjustments and limit new opportunities.

A growing local agriculture. Local agriculture should be recognized as a substantial and growing component of Maine agriculture. It needs to be placed in the mainstream of the agricultural community, and receive appropriate policy and program support.

Sustainable rather than linear agriculture. Maine agriculture needs to be thought of as cyclical rather than linear. We cannot compete by importing inputs with high levels of embedded energy. Using the outputs of our own agricultural activities or of local urban activities as inputs for other agricultural activities will contribute to a more viable agricultural future, but will require a reconception of the agricultural enterprise and the public role in agricultural recycling.

Multi-functionality of Maine farms important. We need to recognize that farms provide a number of important public amenities, like open space and recreation, that Maine residents value highly but do not purchase in the marketplace. These benefits, often referred to as multi-functional farm outputs, require public support. We need policies to assure that these benefits will continue to be provided, and that farms are appropriately compensated.

Shared vision as guide. State agricultural policy must be guided by a shared vision rather than by narrow interests within and outside the industry. For a more viable future agriculture in Maine, a shared vision must trump special interests in the development of public policy and the delivery of public services.

Conclusion

Maine agriculture has historically adapted to changing environments. It will continue to do so. The result of that adaptation will *not* look like agriculture in major production areas of the country. The vitality of Maine agriculture rests less on our ability to copy other agricultural areas, and more on our ability to innovate with our own resources and constraints.

Appendix A: Integrating enterprises on mid-sized farms

While it is sometimes difficult to statistically demonstrate the trend of mid-sized farms adopting integration strategies, it can be observed anecdotally. One case is management intensive rotational grazing (MIRG), especially in the dairy sector. A substantial number of Maine dairy farmers have found that they can reduce costs by intensively managing their pastures with a series of paddocks, displacing much of the forage produced by row cropping and the grain previously imported from the mid-west. A recent survey of dairy farms in central Maine indicates that more than half are doing some degree of MIRG.

Another example is integrating cash crops and livestock enterprises. This is taking at least two forms. In one case dairy farms are adding vegetable production on the same farm. Agriculture Commissioner Spear's family farm is a good example of that kind of farm structure change. In another form, two different commodity farms are cooperating to manage their land base as a single unit. The Fogler/Dorman dairy/potato operation in Exeter is a prominent case, although there are others in that same area and around the state. Recent work at the University of Maine indicates that integrating potatoes and dairy can increase both net farm income and farming value-added substantially (Files).

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